INDIANA DEPARTMENT OF TRANSPORTATION

INTER-DEPARTMENT COMMUNICATION

232-6775

August 20, 2004

DESIGN MEMORANDUM No. 04-07
TECHNICAL ADVISORY

TO: **All Design, Operations, and District Personnel, and Consultants**

FROM: ***/s/ Anthony L. Uremovich***
Anthony L. Uremovich
Design Policy Engineer
Contracts and Construction Division

SUBJECT: **Measurement and Payment for Paving Work at Structure Installation or Replacement**

SUPERSEDES: ***Indiana Design Manual*** **Section 17-3.03**

EFFECTIVE: **March 16, 2005, Letting**

Paving work at an installation or replacement of a pipe, culvert, structure, or utility line placed either transversely or longitudinally under an existing paved-roadway alignment will be measured and paid for separately as described below.

A. Determining the Longitudinal Pay Limits of the Pavement Replacement

The designer should use Recurring Plan Detail 715-R-478d, included herewith, and the following equations to determine the longitudinal pay limits, *L*, in meters (linear feet), of the pavement replacement.

1. Metric-Units Project.

   a. Structure of 750 mm Diameter/Span or Smaller.

$$L = 1.6 + \frac{d}{6} + \frac{B_c}{1000}$$ [Equation 03-__.1M]

where d = vertical distance from flow line to profile grade, meters
B_c = inside diameter or span, millimeters

b. Structure of Diameter/Span of Greater Than 750 mm.

$$L = 1.2 + \frac{d}{6} + 0.0016B_c$$ [Equation 03-__.2M]

2. English-Units Project.

a. Structure of 30 in. Diameter/Span or Smaller.

$$L = 5.5 + \frac{d}{6} + \frac{B_c}{12}$$ [Equation 03-__.1E]

where d = vertical distance from flow line to profile grade, feet
B_c = inside diameter or span, inches

b. Structure of Diameter/Span of Greater Than 30 in.

$$L = 4 + \frac{d}{6} + 0.13B_c$$ [Equation 03-__.2E]

B. Determining Pavement Quantities

The pavement material to be placed should match the existing pavement section as closely as possible. If the existing section is shallower than the minimum section shown on Recurring Plan Detail 715-R-478d, such minimum section should be specified. The designer will determine the existing pavement section from the most recent approved pavement design or existing typical cross sections details. If the existing asphalt pavement section cannot be determined, the minimum HMA section shown on Recurring Plan Detail 715-R-478d with 240 kg/m^2 (440 lb/yd^2) HMA Base should be specified. If the existing concrete pavement section cannot be determined, a minimum PCCP section of 225 mm (9 in.) depth should be specified. The same new pavement section should be used for both travelway and shoulders.

1. Asphalt Pavement. New hot mix asphalt (HMA) pavement quantities should be determined for Surface, Intermediate, and/or Base courses. The thickness of each course should approximate that in place with consideration given to current practice in determining course thicknesses. If a thicker section than the minimum is required, the

additional thickness should consist of HMA Base 25.0 mm. The courses and lay rates should be shown on the plans. The code numbers and pay items are as follows:

715-08282, HMA for Structure Installation, Type A
715-08305, HMA for Structure Installation, Type B
715-08306, HMA for Structure Installation, Type C
715-08307, HMA for Structure Installation, Type D

The pay unit is megagram (ton). The type should be determined as described in *Indiana Design Manual* Section 52-9.02(03). Quantities should be determined for each course and summed to obtain a total quantity of HMA for structure installation to be shown on the plans on the Structure Data Sheet in the Pavement Replacement, HMA columns.

2. Concrete Pavement. The required new portland cement concrete pavement (PCCP) quantity is the travelway and shoulder widths times *L* as determined above. The code number and pay item are 715-08283, PCCP for Structure Installation. The pay unit is square meter (square yard). The same pay item should be specified without regard to the required pavement depth. The required depth should be shown on the plans. The new subbase should match the existing thickness and type, whether the existing subbase is open graded or dense graded. The PCCP quantity should be shown on the plans on the Structure Data Sheet in the Pavement Replacement, PCCP column.

3. Composite Asphalt over Concrete Base. HMA of the thickness in place should be placed on PCCP of the minimum or greater thickness if required. The HMA material should consist of HMA for Structure Installation as required. The new subbase should match the existing thickness and type, whether the existing subbase is open graded or dense graded. The quantities should be determined and shown on the plans as described in Items 1 and 2 above.

C. Determining Backfill Quantities

Quantities for backfill should be determined based on the section shown in Recurring Plan Detail 715-R-478d. Flowable backfill should be used under all pavements except for drives and paved parking lots. Structure backfill should be used under drives and paved parking lots except as specified in INDOT *Standard Specifications* Section 715.08. The backfill quantities should be shown on the Structure Data Sheet in the appropriate Backfill column. If no Structure Data Sheet is included with the plans, the backfill quantities should still be shown on the plans.

D. Determining Underdrain Quantities

Underdrains, if present, should be perpetuated. The only pay quantity will be for the linear measure of underdrains based on the existing configuration. The code number and pay item for this work are 718-08308, Underdrain, Patching. The pay unit is meter (linear foot). Quantities should not be determined for underdrain pipes, aggregate for underdrains, geotextile for underdrains, HMA for underdrains, outlet protector if required, video inspection for underdrains, and all other incidentals for underdrains, as this work is included in the cost of the pay item.

E. Specifications and Details

Recurring Special Provision 715-R-478, and Recurring Plan Detail 715-R-478d, metric- or english-units version as required, should be called for as contract documents through the August 17, 2005, letting. Beginning with the September 14, 2005, letting, these documents become INDOT *Standard Specifications* and *Standard Drawings*, respectively, so they then should not be called for specifically.

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Attachments

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